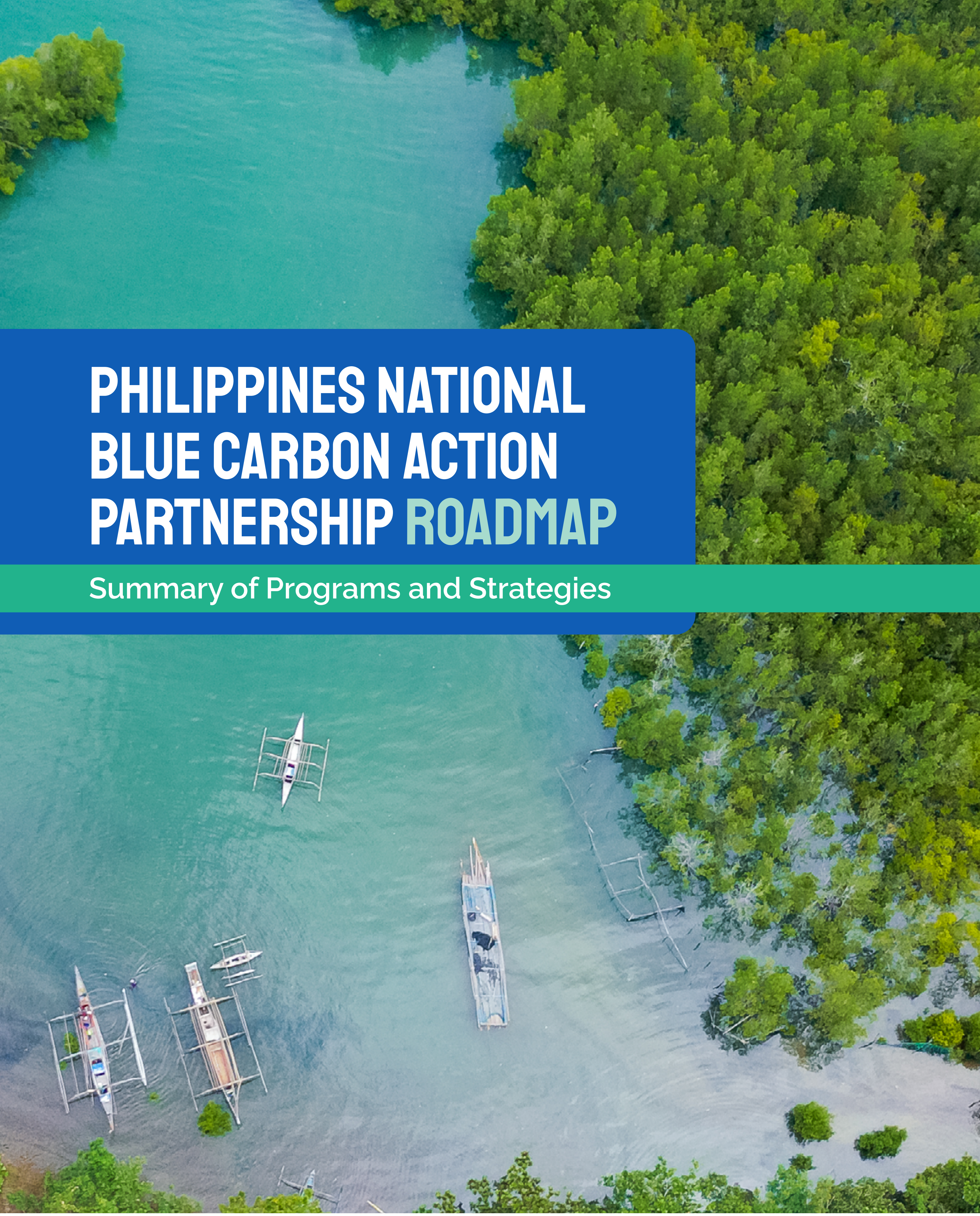


PHILIPPINES NATIONAL BLUE CARBON ACTION PARTNERSHIP ROADMAP

Summary of Programs and Strategies

PHILIPPINES NBCAP
National Blue Carbon Action Partnership

ZSL
200 YEARS OF WILDLIFE

UK International Development
Partnership | Progress | Prosperity

PHILIPPINES NATIONAL BLUE CARBON ACTION PARTNERSHIP ROADMAP

Summary of Programs and Strategies

SUGGESTED CITATION

NBCAP Philippines. (2025). Philippines National Blue Carbon Action Partnership Roadmap: Summary of Programs and Strategies [Abridged Working Document]. National Blue Carbon Action Partnership Philippines, Department of Environment and Natural Resources, and the Zoological Society of London – Philippines.

This document summarizes the programs and strategies of the Philippines National Blue Carbon Action Partnership Roadmap, which is a living document containing the national strategic framework for blue carbon conservation and restoration. The Roadmap has been developed through a multi-sectoral approach involving a series of consultations and content integration. Implementation will require further refinement, policy development, and resource mobilization, in accordance with national priorities and international commitments.

CONTRIBUTING PARTNERS

The Roadmap has been developed through collaborative efforts of the Department of Environment and Natural Resources – Biodiversity Management Bureau and the Department of Agriculture – Bureau of Fisheries and Aquatic Resources, in partnership with the Zoological Society of London – Philippines, Global Mangrove Alliance Philippines Chapter (Conservation International Philippines, Forest Foundation Philippines, Rare Philippines, Wetlands International Philippines, and World Wide Fund for Nature Philippines), other national government agencies (Department of Finance, Department of the Interior and Local Government, Department of Public Works and Highways, and Department of Tourism), academic institutions, Local Government Units, and community stakeholders.

ABOUT THE NATIONAL BLUE CARBON ACTION PARTNERSHIP

The National Blue Carbon Action Partnership (NBCAP) of the Philippines is a multi-stakeholder platform bringing together national and local government, academic and research institutions, civil society organizations, the private sector, and coastal communities to coordinate blue carbon conservation and restoration efforts across the country.

The development of the Roadmap is supported through a partnership with the World Economic Forum, with funding from the UK Government.

FOR MORE INFORMATION

DENR Biodiversity Management Bureau
✉ bmb@bmb.gov.ph

Zoological Society of London – Philippines
c/o Edwina D. Garchitorena, Country Director
✉ Edwina.Garchitorena@zsl.org

CONTENTS

Overview 6

Why Blue Carbon is Important for the Philippines 8

The Philippines' Blue Carbon Ecosystems 10

The Roadmap 12

Strategic Action Area 1: Policy and Governance 14

Strategic Action Area 2: Science, Technology, and Innovation 19

Strategic Action Area 3: Communications and Community Engagement 26

Strategic Action Area 4: Finance and Sustainable Livelihoods 33

Maximizing climate benefits while supporting coastal communities 38

References 40

OVERVIEW

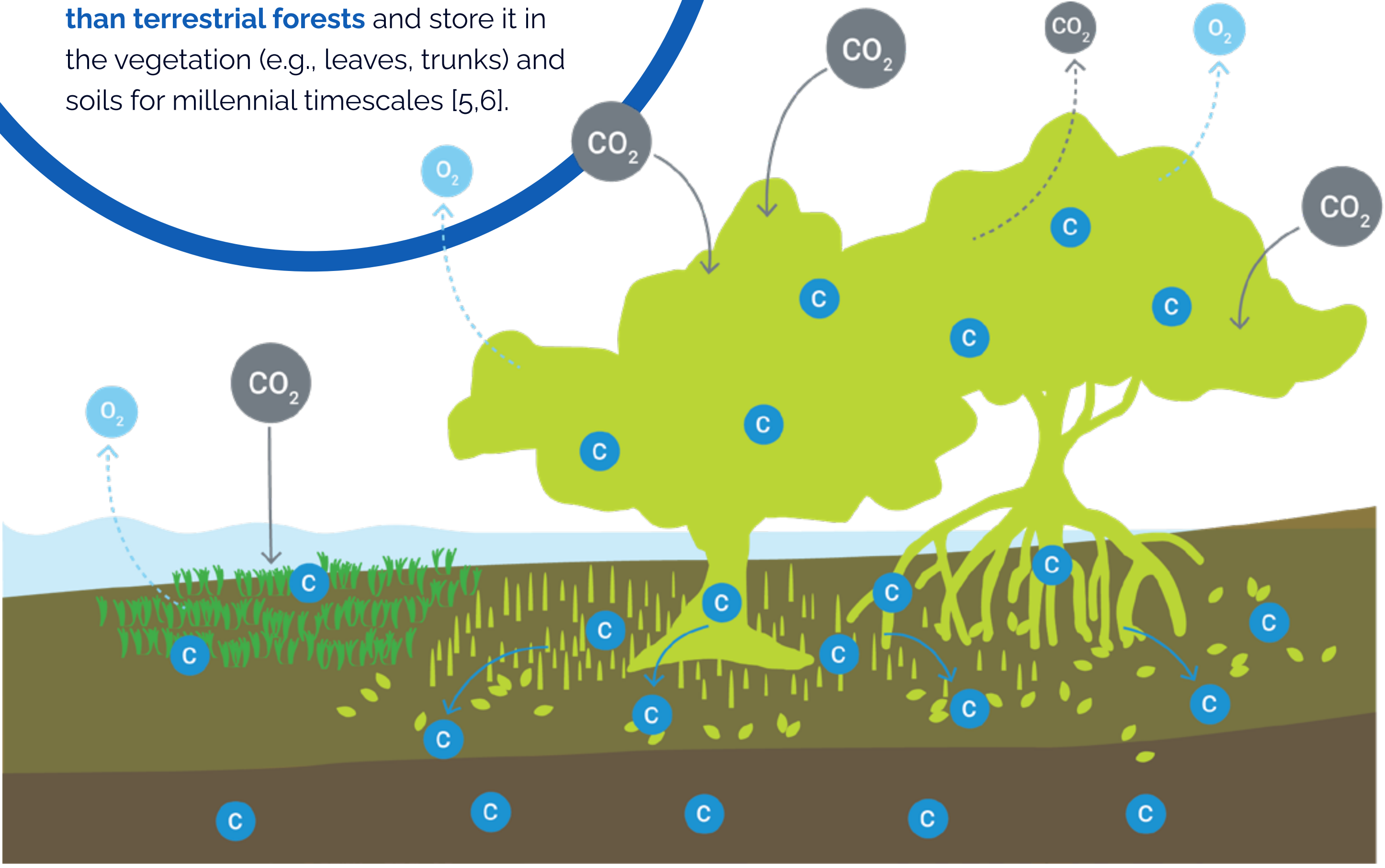
PURPOSE OF THE ROADMAP

This roadmap provides a strategic framework for the Philippines to harness the potential of blue carbon ecosystems—mangroves, seagrasses, and tidal marshes—in addressing climate change while supporting coastal communities and biodiversity conservation. It outlines coordinated actions across policy, science, stakeholder engagement, and finance to achieve sustainable management of these critical ecosystems. The roadmap responds to the recognition of the need to include blue carbon ecosystems explicitly in national climate commitments [1].

THE PHILIPPINES NATIONAL BLUE CARBON ACTION PARTNERSHIP ROADMAP SETS THE LONG-TERM DIRECTION FOR HARNESSING BLUE CARBON ECOSYSTEMS FOR BIODIVERSITY CONSERVATION, SUSTAINABLE DEVELOPMENT, AND CLIMATE RESILIENCE.

What is
blue carbon?

Blue carbon refers to carbon captured and stored by coastal and marine ecosystems, particularly **mangroves, seagrasses, and tidal marshes** [2,3]. These ecosystems cover less than 0.5% of the ocean floor but store over half of the ocean's carbon [4,5]. They **sequester carbon at rates up to 40 times higher than terrestrial forests** and store it in the vegetation (e.g., leaves, trunks) and soils for millennial timescales [5,6].



WHY BLUE CARBON IS IMPORTANT FOR THE PHILIPPINES

BLUE CARBON ECOSYSTEMS LIKE MANGROVES AND SEAGRASS BEDS ARE EXCEPTIONAL CARBON SINKS, BUT BECOME DISASTROUS CARBON EMITTERS WHEN DESTROYED.

CARBON SINK CAPACITY

The Philippines' blue carbon ecosystems provide exceptional climate mitigation potential:

Mangroves sequester **1.32±0.35 Mg C ha^{-1} yr^{-1}** with soil carbon stocks up to **1,215 Mg C ha^{-1}**, and post-disturbance recovery stands showing sequestration rates of **1.49 to 3.79 Mg C ha^{-1} yr^{-1}** [7,8].

Seagrass meadows capture **33.5±7.3 g C m^{-2} yr^{-1}** with sediment carbon averaging **140.7 Mg C ha^{-1}**, though storage capacity varies significantly based on species richness and environmental conditions [9].

These ecosystems represent significant untapped potential for the Philippines' Nationally Determined Contributions (NDC) under the Paris Agreement [1,10].

DID YOU KNOW?
Mangrove forests provide at least US$1.6 billion (PhP80 billion) each year in ecosystem services and support coastal livelihoods worldwide.
Polidoro et al., 2010

CLIMATE CHANGE MITIGATION AND ADAPTATION

When blue carbon ecosystems degrade, they release ancient carbon, unfortunately becoming sources of greenhouse gases [11]. Protecting and restoring blue carbon ecosystems represent a natural climate solution that can effectively help achieve climate targets under the Paris Agreement [4,10].

MULTIPLE CO-BENEFITS

Beyond carbon storage, blue carbon ecosystems provide [5,11]:

Coastal protection from storm surges, typhoons, and erosion;

Biodiversity habitat supporting fisheries and endemic species;

Livelihood opportunities for coastal communities through sustainable fisheries, ecotourism, and restoration enterprises;

Water quality improvement and nutrient cycling; and

Climate adaptation through natural infrastructure that enhances community resilience.

THE PHILIPPINES' BLUE CARBON ECOSYSTEMS

THE PHILIPPINES HAS DIVERSE MANGROVES AND SEAGRASS BEDS THAT ARE CRITICAL IN MITIGATING CLIMATE CHANGE IMPACTS.

MANGROVE ECOSYSTEMS

The Philippines hosts approximately **327,000 ha** of mangroves (2023 data; 12), representing one of the largest mangrove areas in Southeast Asia. With 39 true mangrove species—47% of the world's total—the country demonstrates exceptional mangrove biodiversity. Major concentrations are found in Palawan, Sulu, and Zamboanga Peninsula, with carbon sequestration rates of **1.49 to 3.79 Mg C ha^{-1} yr^{-1}** documented in Eastern Visayas and other regions [7,8,9].

SEAGRASS ECOSYSTEMS

The Philippines hosts 18 of the world's 60 seagrass species [13]. These ecosystems support critical fisheries, provide habitat for dugongs and sea turtles, and play vital roles in coastal ecosystem connectivity. Only estimates on current areal extent for seagrass beds in the country exist, though there have been nationwide efforts for habitat mapping, as well as assessments of change in cover over time [14].

COASTAL PROTECTION VALUE

As an archipelagic nation with extensive coastlines and high vulnerability to typhoons and sea-level rise [15,16,17], the Philippines relies heavily on blue carbon ecosystems for natural coastal defense. These ecosystems reduce wave energy, prevent erosion, and protect communities and infrastructure from storm damage. **Their protection and sustainable management are a national concern, and the responsibility of every Filipino**.

THE ROADMAP

VISION

By 2030 and beyond, healthy and resilient blue carbon ecosystems thrive across the Philippines, sustainably managed through inclusive actions that deliver climate benefits and support community livelihoods.

MISSION

Unite stakeholders across government, civil society, academia, private sector, and communities in coordinated action for the protection, restoration, and sustainable management of blue carbon ecosystems.

The roadmap is organized into four strategic action areas, each containing targeted programs and activities:

- **Policy and Governance**
- **Science, Technology, and Innovation**
- **Communications and Community Engagement**
- **Finance and Sustainable Livelihoods**

STRATEGIC ACTION AREA

1. POLICY AND GOVERNANCE

Objective:
Establish legal frameworks, policies, and institutional mechanisms for blue carbon ecosystem management

2. SCIENCE, TECHNOLOGY, AND INNOVATION

Objective:
Strengthen scientific knowledge, monitoring systems, and evidence-based conservation practices

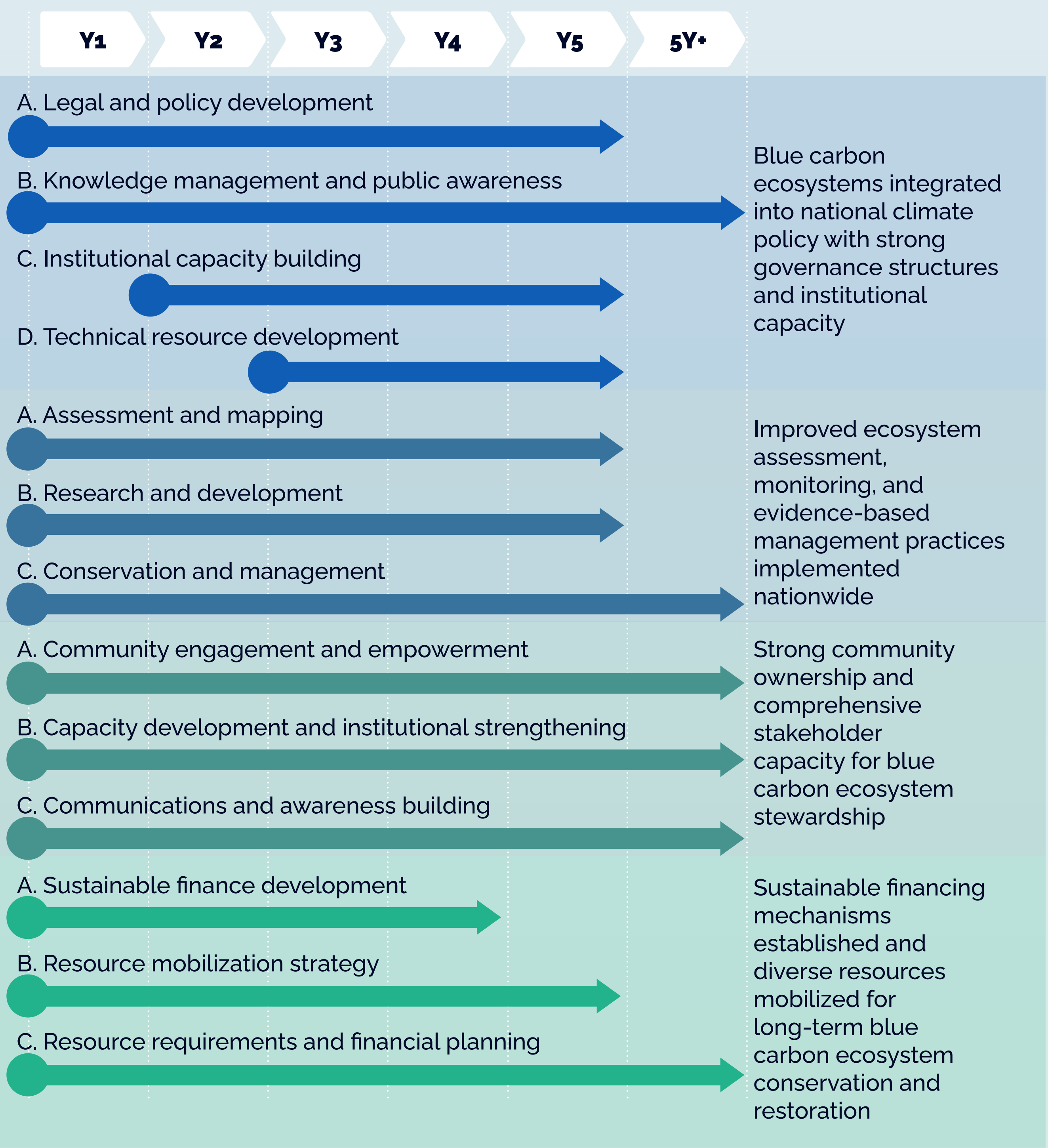
3. COMMUNICATIONS AND COMMUNITY ENGAGEMENT

Objective:
Build capacity and engage communities, government, private sector, and other stakeholders in collaborative management

4. FINANCE AND SUSTAINABLE LIVELIHOODS

Objective:
Develop sustainable financing mechanisms and mobilize resources for long-term ecosystem conservation and restoration

STRATEGIC FRAMEWORK OVERVIEW



PROGRAMS

A. Legal and policy development

B. Knowledge management and public awareness

C. Institutional capacity building

D. Technical resource development

A. Assessment and mapping

B. Research and development

C. Conservation and management

A. Community engagement and empowerment

B. Capacity development and institutional strengthening

C. Communications and awareness building

A. Sustainable finance development

B. Resource mobilization strategy

C. Resource requirements and financial planning

OUTCOME

Blue carbon ecosystems integrated into national climate policy with strong governance structures and institutional capacity

Improved ecosystem assessment, monitoring, and evidence-based management practices implemented nationwide

Strong community ownership and comprehensive stakeholder capacity for blue carbon ecosystem stewardship

Sustainable financing mechanisms established and diverse resources mobilized for long-term blue carbon ecosystem conservation and restoration

STRATEGIC ACTION AREA I:

POLICY AND GOVERNANCE

Outcome:

Blue carbon ecosystems integrated into national climate policy with strong governance structures and institutional capacity

CREATING AN ENABLING POLICY ENVIRONMENT FOR EFFECTIVE PROTECTION AND RESTORATION OF BLUE CARBON ECOSYSTEMS

PROGRAM A:
LEGAL AND POLICY DEVELOPMENT

PROGRAM B:
KNOWLEDGE MANAGEMENT AND PUBLIC AWARENESS

PROGRAM C:
INSTITUTIONAL CAPACITY BUILDING

PROGRAM D:
TECHNICAL RESOURCE DEVELOPMENT

PROGRAM A:
LEGAL AND POLICY DEVELOPMENT

DEVELOP AN EXECUTIVE FRAMEWORK

- **Blue Carbon policy framework:** Develop comprehensive national policy integrating mangroves, seagrasses, and tidal marshes into climate and development planning using the IUCN National Blue Carbon Policy Assessment framework [18].
- **Legislative Steering Committee or LSC:** Establish multi-stakeholder body to coordinate policy development and implementation across agencies.
- **Blue Carbon Bill:** Draft legislation providing legal definitions, protective designations, restoration requirements, and frameworks for carbon credits and community participation.
- **Department Administrative Orders:** Develop operational guidelines for the Department of Environment and Natural Resources (DENR), Department of Agriculture – Bureau of Fisheries and Aquatic Resources (DA-BFAR), and other national government agencies on ecosystem management, carbon rights, benefit-sharing, and safeguards [19,20,21].
- **Ecosystem restoration policy:** Integrate blue carbon into broader ecosystem restoration initiatives and national greening programs.
- **Coastal infrastructure integration:** Develop guidelines incorporating blue carbon ecosystems into coastal development planning and infrastructure projects.
- **Fishpond mapping and regulation:** Comprehensive mapping of Abandoned, Undeveloped, and Underutilized (AUU) fishponds for potential ecosystem reversion.
- **International commitments harmonization:** Align blue carbon policy with NDCs, Paris Agreement mechanisms, and clarify allocation between compliance and voluntary carbon markets [1,10].

CREATE AN ENABLING ENVIRONMENT WITH POLICY PRIORITIES

- **Carbon Rights Bill:** Define legal framework for blue carbon credit ownership, recognizing community and Indigenous Peoples' rights.
- **Benefit-sharing mechanisms:** Establish equitable frameworks for distributing carbon revenues to communities and stakeholders.
- **Environmental and social safeguards:** Implement robust protections ensuring conservation actions respect rights and avoid harm.
- **Coastal development regulations:** Strengthen controls on developments impacting blue carbon ecosystems.
- **Forest Reference Emission Level or FREL study:** Conduct baseline assessment for blue carbon ecosystems to support climate reporting and carbon accounting for inclusion in the National Greenhouse Gas (GHG) Inventory [1,22].

INTEGRATE BLUE CARBON IN LOCAL GOVERNMENT PLANNING & MANAGEMENT

- **Comprehensive Land Use Plan mainstreaming:** Issue a Joint Memorandum Circular, e.g., involving the DENR, DA-BFAR, and the Department of the Interior and Local Government, for blue carbon integration in local planning.
- **Local Ordinance templates:** Develop model ordinances for Local Government Unit (LGU) adoption on ecosystem protection and sustainable use.
- **Protected Area enhancement:** Strengthen management effectiveness of existing protected areas containing blue carbon ecosystems.
- **Seal of Good Local Governance integration:** Include blue carbon indicators in LGU performance assessment.

PROGRAM B:
KNOWLEDGE MANAGEMENT AND PUBLIC AWARENESS

- **Development of compelling communications products:** Create IEC materials for diverse audiences explaining blue carbon importance and management.
- **Social media campaigns:** Deploy localized content across platforms to build public awareness and support.
- **Stakeholder education:** Conduct targeted information campaigns for policymakers, LGUs, communities, and private sector.

PROGRAM C:
INSTITUTIONAL CAPACITY BUILDING

- **LGU policy integration capacity:** Train local government staff on blue carbon policy frameworks and implementation mechanisms.
- **Effective policy rollout:** Develop systems ensuring policies translate into ground-level action.
- **Training of Trainers (TOT) Programs:** Build cadres of trainers who can cascade capacity building nationwide.
- **Monitoring and Evaluation systems:** Establish frameworks for tracking policy implementation and effectiveness.

PROGRAM D:
TECHNICAL RESOURCE DEVELOPMENT

BUILD HUMAN RESOURCE CAPACITY

- **Technical expertise development:** Build specialized skills in blue carbon assessment, policy analysis, and governance.
- **Training programs:** Systematic capacity development across government agencies, LGUs, and partner organizations.

PROVIDE FOR INFRASTRUCTURE AND EQUIPMENT

- **Research facilities:** Establish or enhance facilities for blue carbon research and analysis.
- **Monitoring equipment:** Procure and deploy tools for ecosystem assessment and carbon measurement.
- **Data management systems:** Develop integrated platforms for blue carbon data collection, storage, and analysis.

STRATEGIC ACTION AREA 2:

SCIENCE, TECHNOLOGY, AND INNOVATION

Outcome:

Improved ecosystem assessment, monitoring, and evidence-based management practices implemented nationwide

PROGRAM A:
ASSESSMENT AND MAPPING

PROGRAM B:
RESEARCH AND DEVELOPMENT

PROGRAM C:
CONSERVATION AND MANAGEMENT

ENHANCING BLUE CARBON SCIENCE FOR BETTER MANAGEMENT, MONITORING, AND DECISION-MAKING

PROGRAM A:
ASSESSMENT AND MAPPING

UNDERTAKE A NATIONAL BASELINE ASSESSMENT THROUGH MULTI-DISCIPLINARY RESEARCH

- **Comprehensive ecosystem mapping:** Generate high-resolution spatial data on distribution, extent, and condition of all blue carbon ecosystems. Building on the 2023 National Mangrove Map led by the Philippine Space Agency and DENR [12], comprehensive mapping should include species-level detail for mangroves, improved seagrass meadow coverage, and tidal marsh identification.
- **Carbon stock assessment:** Quantify above-ground, below-ground, and soil carbon stocks using standardized methodologies including the Coastal Blue Carbon Manual, IPCC Wetland Supplement, and the Philippines' Blue Carbon Quantification Protocol (BCQP; 2,22,23).
- **Biodiversity inventory:** Document species composition, endemic taxa, and ecological connectivity.
- **Threat analysis:** Identify and map pressures from development, pollution, climate change, and other anthropogenic impacts. Monitor spatial and temporal changes in ecosystem distribution, carbon-sink capacity, and potential threats [22].
- **Socio-economic profiling:** Assess community dependencies, livelihoods, and governance structures.

STANDARDIZE AND INTEGRATE MONITORING AND EVALUATION SYSTEMS

- **Standardized protocols:** Establish national standards for ecosystem monitoring and carbon measurement using verified protocols compatible with GHG inventories [2,22,23].
- **Integrated remote sensing:** Deploy satellite imagery, LiDAR, and drone technology for large-scale monitoring.
- **Carbon and health monitoring:** Track ecosystem carbon dynamics and ecological condition over time.
- **Management effectiveness evaluation:** Assess conservation interventions and adaptive management outcomes.

PROGRAM B:
RESEARCH AND DEVELOPMENT

UNDERTAKE CROSS-DISCIPLINARY RESEARCH ACROSS RELEVANT PRIORITY CONCERNS

- **Biodiversity assessment:** Document species diversity, functional ecology, and conservation status.
- **AUU fishpond reversion research:** Study ecological and socio-economic feasibility of converting abandoned ponds to natural ecosystems.
- **Ecosystem service valuation:** Quantify economic value of carbon sequestration, coastal protection, fisheries support, and other services using environmental-economic accounting frameworks such as the UN System of Environmental-Economic Accounting [24].
- **Gender and social inclusion research:** Examine differential impacts and opportunities across demographics.
- **Climate change vulnerability assessment:** Project ecosystem responses to sea-level rise, temperature change, and extreme events.
- **Innovative restoration methodology:** Develop context-appropriate restoration techniques and success metrics following international principles and standards for ecological restoration [25].
- **Anthropogenic impact assessment:** Study effects of pollution, overexploitation, and land-use change.

DEVELOP TECHNOLOGIES AND PROTOCOLS

- **Blue Carbon Quantification Protocol institutionalization:** Establish the BCQP, which was developed by Philippine blue carbon scientists and practitioners [23], as the national standard for carbon assessment, reducing costs, and increasing nationwide capacity.
- **Remote sensing and modeling:** Advance satellite analysis, predictive models, and spatial planning tools.
- **Restoration technology:** Develop propagation techniques, planting methodologies, and success monitoring systems.
- **Conservation technology and threat detection:** Deploy sensors, automated monitoring, and early-warning systems.
- **Equipment sharing networks:** Establish mechanisms for shared access to specialized research tools.

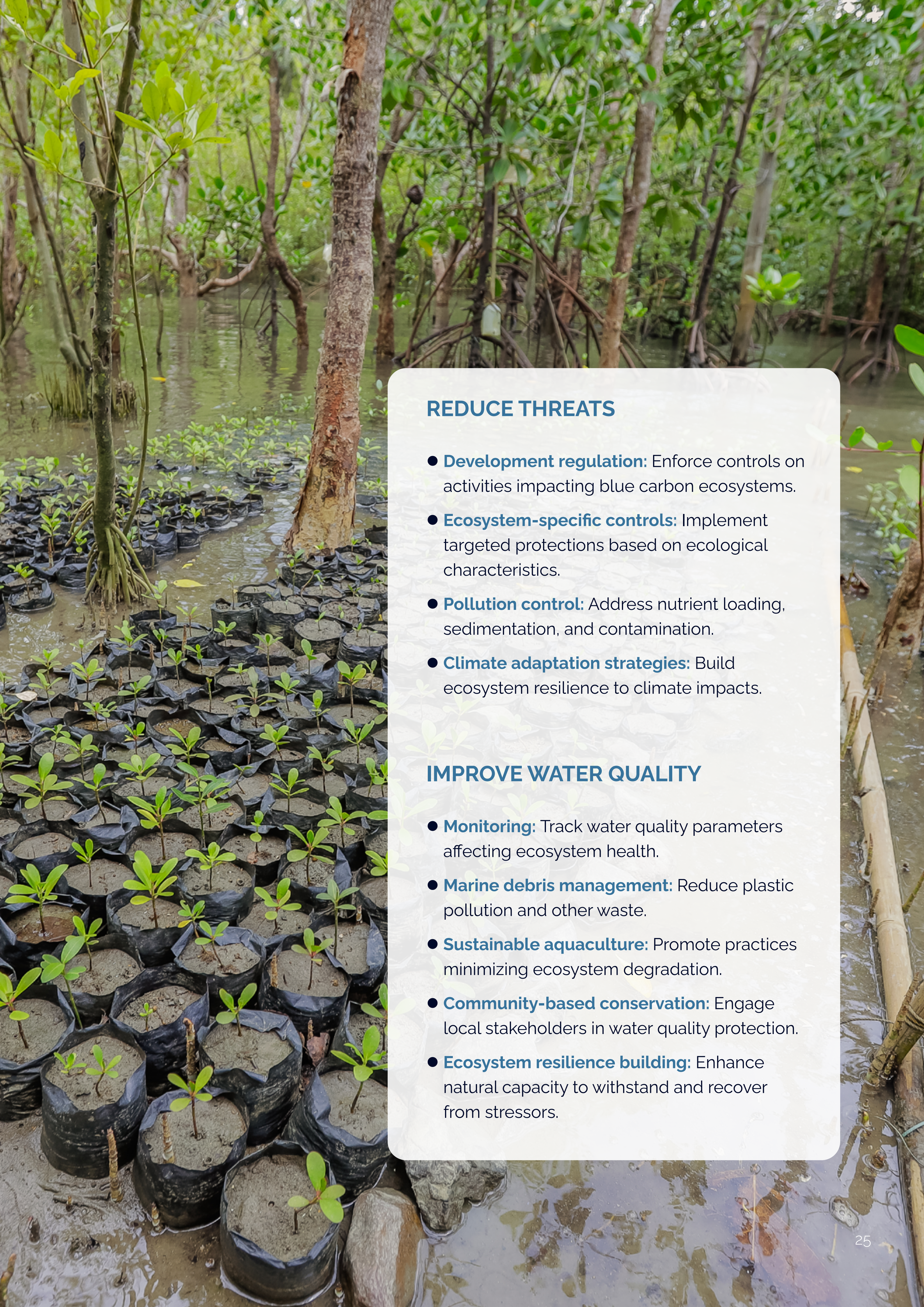
PROGRAM C:
CONSERVATION AND MANAGEMENT

ADOPT SPATIAL PLANNING & MANAGEMENT

- **Conservation zoning:** Delineate strict protection zones, buffer zones, sustainable use zones, and rehabilitation zones.
- **Protected areas enhancement:** Strengthen management effectiveness of existing marine protected areas and coastal reserves.
- **Blue Carbon Councils:** Establish provincial and regional coordination bodies for multi-jurisdictional management.

IMPLEMENT SCIENCE-BASED RESTORATION PROGRAMS

- **Enhanced rehabilitation practices:** Apply science-based approaches prioritizing natural regeneration and appropriate species selection. Conduct nationwide assessments to identify degraded or lost blue carbon areas with high restoration potential using methodologies such as the Restoration Opportunities Assessment Methodology or ROAM [26].
- **Site-specific restoration plans:** Create detailed restoration plans for priority sites incorporating scientific assessment, community needs, traditional knowledge, and best practices [25,27,28].
- **Enrichment planting:** Restore biodiversity in degraded ecosystems through strategic species introduction.
- **Community nurseries:** Support local propagule collection and nursery operations.
- **Associated Mangrove Aquaculture:** Integrate sustainable aquaculture with mangrove conservation.
- **Green Infrastructure integration:** Incorporate blue carbon ecosystems into coastal development planning.
- **Fish stock enhancement:** Restore fisheries productivity through habitat rehabilitation.



REDUCE THREATS

- **Development regulation:** Enforce controls on activities impacting blue carbon ecosystems.
- **Ecosystem-specific controls:** Implement targeted protections based on ecological characteristics.
- **Pollution control:** Address nutrient loading, sedimentation, and contamination.
- **Climate adaptation strategies:** Build ecosystem resilience to climate impacts.

IMPROVE WATER QUALITY

- **Monitoring:** Track water quality parameters affecting ecosystem health.
- **Marine debris management:** Reduce plastic pollution and other waste.
- **Sustainable aquaculture:** Promote practices minimizing ecosystem degradation.
- **Community-based conservation:** Engage local stakeholders in water quality protection.
- **Ecosystem resilience building:** Enhance natural capacity to withstand and recover from stressors.

STRATEGIC ACTION AREA 3:

COMMUNICATIONS AND COMMUNITY ENGAGEMENT

Outcome:
Strong community ownership and comprehensive stakeholder capacity for blue carbon ecosystem stewardship

PROGRAM A:
COMMUNITY ENGAGEMENT AND EMPOWERMENT

PROGRAM B:
CAPACITY DEVELOPMENT AND INSTITUTIONAL STRENGTHENING

PROGRAM C:
COMMUNICATIONS AND AWARENESS BUILDING

BAWAL MANG-UTOD SANG MANGROVES
(NO CUTTING OF MANGROVES)
CITY ORDINANCE NO. 10-2022

EMPOWERING COMMUNITIES AS STEWARDS OF BLUE CARBON ECOSYSTEMS

PROGRAM A:
COMMUNITY ENGAGEMENT AND EMPOWERMENT

MANGROVE NURSERY
ZSL
PEDADA

EMPHASIZE PARTICIPATORY MANAGEMENT

- **Community-based management:** Strengthen people's organizations and cooperatives for ecosystem stewardship. Inclusive participation and equitable benefit-sharing are not only ethical but essential for the long-term success and sustainability of blue carbon initiatives [19,20].
- **Indigenous Knowledge integration:** Incorporate traditional ecological knowledge into conservation practices.
- **Local stewardship:** Build community ownership through participatory planning and decision-making.
- **Collaborative governance and conflict resolution:** Establish mechanisms for multi-stakeholder coordination and dispute management.

ELMER BABIERA BIODIVERSITY CONSERVATION LEARNING CENTER
Pedada Eco-Park

DEVELOP AND DIVERSIFY LIVELIHOOD OPTIONS

- **Blue Carbon-based enterprises:** Support ecotourism, mangrove beekeeping, sustainable aquaculture, seaweed farming, and restoration enterprises.
- **Market-based instruments:** Connect communities to carbon markets and ecosystem service payments.
- **Payment for Ecosystem Services (PES) programs:** Establish frameworks compensating communities for conservation actions.

ESTABLISH EQUITABLE AND INCLUSIVE BENEFIT-SHARING MECHANISMS

- **Revenue sharing:** Distribute carbon credit revenues equitably to communities and stakeholders.
- **Community development funds:** Channel resources toward local priorities including infrastructure, education, and health.
- **Social services integration:** Link conservation benefits to community welfare improvements.

PROGRAM B:
CAPACITY DEVELOPMENT AND INSTITUTIONAL STRENGTHENING

BUILD TECHNICAL CAPACITY

- **Blue carbon science and assessment:** Train stakeholders in carbon measurement, monitoring protocols, and data analysis.
- **Ecosystem services valuation:** Build capacity for economic analysis of conservation benefits.
- **Restoration and monitoring implementation:** Develop practical skills for field-based conservation work.

STRENGTHEN INSTITUTIONAL ARRANGEMENTS

- **LGU capacity building:** Enhance local government technical and administrative capabilities for blue carbon management.
- **Community organization:** Strengthen people's organizations, cooperatives, and civil society networks.
- **Network strengthening:** Build connections among stakeholders for knowledge exchange and collaboration.
- **Tenure rights education:** Ensure communities understand and can exercise their resource rights.
- **Policy framework education:** Build stakeholder understanding of blue carbon policies and implementation mechanisms.
- **Benefit-sharing and financial literacy:** Equip communities to engage effectively with carbon markets and financing.

PROGRAM C:
COMMUNICATIONS AND AWARENESS BUILDING

DEVELOP A COMMUNICATIONS FRAMEWORK

- **Educational system integration:** Collaborate with the Department of Education to incorporate blue carbon into curricula.
- **Multi-audience communication:** Develop tailored messages for policymakers, communities, private sector, and general public.
- **Grassroots awareness building:** Conduct community-level education on ecosystem importance and conservation practices.
- **Traditional Knowledge integration:** Document and share Indigenous and local ecological knowledge.

ENGAGE THE MEDIA

- **Strategic partnerships:** Collaborate with media outlets for blue carbon coverage.
- **Digital engagement:** Leverage social media, websites, and digital platforms for awareness building.
- **Evidence-based communication:** Ground public messaging in scientific findings and success stories.

INTENSIFY STAKEHOLDER OUTREACH

- **Private sector partnerships:** Engage businesses in conservation through corporate social responsibility (CSR) and supply chain sustainability.
- **Institutional quality assurance:** Ensure consistency and credibility in blue carbon messaging.
- **Knowledge exchange systems:** Facilitate sharing of lessons learned and best practices.
- **Regional training programs:** Conduct multi-country capacity building through regional platforms in Southeast Asia and the Pacific.
- **TOT programs:** Build cascading capacity development systems.
- **Academic partnerships:** Collaborate with universities and research institutions for knowledge generation and dissemination.

STRATEGIC ACTION AREA 4:

FINANCE AND SUSTAINABLE LIVELIHOODS

Outcome:
Sustainable financing mechanisms established and diverse resources mobilized for long-term blue carbon ecosystem conservation and restoration

PROGRAM A:
SUSTAINABLE FINANCE DEVELOPMENT

PROGRAM B:
RESOURCE MOBILIZATION STRATEGY

PROGRAM C:
RESOURCE REQUIREMENTS AND FINANCIAL PLANNING

HARNESSING INNOVATIVE AND SUSTAINABLE FINANCING CENTERED ON COMMUNITIES

PROGRAM A:
SUSTAINABLE FINANCE DEVELOPMENT

DEVELOP CREDIT SYSTEM FOR CARBON PROJECTS

- **Market mechanisms (compliance and voluntary):** Develop frameworks for participation in both regulated carbon markets and voluntary offset programs. Multiple environmental financing mechanisms can be used to fund the conservation and restoration of blue carbon ecosystems in the Philippines [29,30].
- **Carbon trading platform:** Establish systems for transaction facilitation, registry management, and credit verification using standards such as Verified Carbon Standard or VCS [29].
- **Alignment with Paris Agreement, Article 6:** Ensure blue carbon mechanisms comply with international transfer and mitigation outcome frameworks [10].

GROW ENVIRONMENTAL FUNDS

- **Blue Carbon trust fund:** Establish endowed fund for long-term sustainable financing of conservation and restoration.
- **Grant facilities:** Create funding windows for feasibility studies, community initiatives, and pilot projects.
- **Revolving funds:** Develop patient capital mechanisms with flexible terms for ecosystem restoration enterprises.
- **Endowment funds:** Build permanent capital bases generating perpetual support for blue carbon activities.

EXPLORE DIVERSE MARKET INSTRUMENTS

- **Blue bonds:** Issue debt instruments specifically for marine and coastal conservation projects.
- **Biodiversity credits:** Develop mechanisms for monetizing ecosystem biodiversity values alongside carbon.
- **PES framework:** Establish systems for compensating conservation actions and ecosystem stewardship.
- **Green lending:** Partner with financial institutions to offer preferential financing for blue carbon enterprises.
- **Tenurial instruments for carbon access:** Develop frameworks ensuring community and Indigenous Peoples' access to carbon finance benefits.

PROGRAM B:
RESOURCE MOBILIZATION STRATEGY

IDENTIFY & COMMIT GOVERNMENT SOURCES

- **National budget allocations:** Secure dedicated line items in DENR, DA-BFAR, and related agency budgets.
- **LGU funding:** Mobilize local government investment through Environmental Protection and Enhancement Funds and other mechanisms.
- **Special Purpose funds:** Access climate finance, biodiversity funds, disaster risk reduction, and research and development pools.
- **Environmental taxes and fees:** Earmark portions of environmental levies for blue carbon conservation.

TAP INTO INTERNATIONAL FINANCE

- **Climate finance mechanisms:** Access support from the Green Climate Fund, Adaptation Fund, and Global Environment Facility, among others.
- **Development assistance:** Engage multilateral development banks (e.g., World Bank, ADB, AFD, etc.) and bilateral cooperation programs.
- **Conservation grants:** Secure funding from international foundations and conservation NGOs.

ENGAGE THE PRIVATE SECTOR

- **Corporate partnerships:** Develop strategic alliances with companies for CSR investment and supply chain sustainability.
- **Impact investment:** Attract capital seeking both financial returns and environmental/ social impact.
- **Private foundations:** Engage philanthropic sources for grant funding and technical support.
- **Public-Private Partnerships or PPP:** Structure collaborative financing arrangements leveraging both public and private capital.

PROGRAM C:
RESOURCE REQUIREMENTS AND FINANCIAL PLANNING

IMPLEMENT AN INITIAL FUNDING STRATEGY

- **Comprehensive resource assessment:** Calculate full costs of implementing strategic action areas including policy development, research, capacity building, and restoration activities.
- **Phased implementation planning:** Prioritize activities based on urgency, feasibility, and resource availability.
- **Multi-source financing matrix:** Map funding sources to specific programs and activities.
- **Budget development:** Prepare detailed financial plans for national agencies, LGUs, and partner organizations.

SCALE UP THROUGH A LONG-TERM SUSTAINABILITY FRAMEWORK

- **Financial sustainability planning:** Design revenue streams ensuring continuity beyond initial project periods.
- **Blended finance structures:** Combine grants, concessional loans, and commercial capital to optimize financing.
- **Carbon revenue projections:** Model potential income from carbon markets under various scenarios.
- **Cost recovery mechanisms:** Identify opportunities for self-financing through user fees, ecosystem service payments, and enterprise development.
- **Financial monitoring and reporting:** Establish systems tracking resource allocation, expenditure efficiency, and impact achievement.

ATTRACT INVESTMENT THROUGH DEMONSTRATION PROJECTS

Portfolio of demonstration projects across different ecosystem types, management activities (conservation and restoration), and socio-economic settings [25,27,28]: These projects help illustrate the business case for investments while putting science into action, engaging local communities, and testing governance and financial mechanisms. All demonstration projects should use standardized monitoring protocols [23] to ensure carbon quantification is rigorous and comparable. Developing blue carbon ecosystems at small and large scales can help the Philippines manage the impacts of climate change [19,20].

MAXIMIZING CLIMATE BENEFITS WHILE SUPPORTING COASTAL COMMUNITIES

THE PHILIPPINES HAS A WEALTH OF MANGROVE FORESTS, SEAGRASS MEADOWS, AND TIDAL MARSHES THAT OFFER SIGNIFICANT OPPORTUNITIES FOR CARBON SEQUESTRATION AND CLIMATE CHANGE ADAPTATION.

The Philippines National Blue Carbon Action Partnership Roadmap represents a comprehensive framework for harnessing the climate mitigation and adaptation potential of coastal ecosystems while supporting biodiversity conservation and community livelihoods. Successful implementation requires coordinated action across government, civil society, academia, private sector, and local communities.

The Philippines has the opportunity to place itself at the forefront of international efforts to incorporate coastal carbon in CO_2 mitigation strategies, by strengthening its research agenda, empowering local communities, and permeating governance and financial frameworks with blue carbon. Advancing both the conservation of existing blue carbon ecosystems and restoration of degraded areas will maximize climate benefits while supporting coastal communities.

KEY PRIORITIES MOVING FORWARD

- **Empower local scientists and communities** for high-resolution monitoring and assessment.
- **Educate and engage communities** through co-design and co-management approaches with equitable benefit-sharing.
- **Align and clarify legislation** for governance, carbon rights, and international commitments.
- **Encourage conservation and restoration** using climate and biodiversity finance including carbon markets, PES, and innovative instruments.
- **Build institutional capacity** across all stakeholder types for effective implementation.
- **Strengthen multi-stakeholder partnerships** through the NBCAP platform for knowledge exchange and collaborative action.

By advancing an inclusive blue carbon program, the Philippines will have the opportunity to achieve its NDCs and Sustainable Development Goal commitments [1,10,31], while improving marine biodiversity, enhancing natural capital, and contributing to local livelihoods through conservation and restoration initiatives.

The roadmap is a living document that will be refined through ongoing stakeholder consultation and adaptive management as implementation progresses and new knowledge emerges. By working together across sectors and scales, the Philippines can realize the full potential of its blue carbon ecosystems as nature-based solutions for climate action, biodiversity conservation, and sustainable coastal development.

REFERENCES

(1) Republic of the Philippines. *Updated Nationally Determined Contributions (NDC).* Submission under the Paris Agreement.

(2) Howard, J., Hoyt, S., Isensee, K., Pidgeon, E., Telszewski, M. eds. (2014). *Coastal Blue Carbon: Methods for assessing carbon stocks and emissions factors in mangroves, tidal salt marshes, and seagrass meadows.* Conservation International, Intergovernmental Oceanographic Commission of UNESCO, IUCN. Arlington, Virginia, USA.

(3) Lovelock, C. E. and Duarte, C. M. (2019). *Dimensions of blue carbon and emerging perspectives.* Biology Letters, 15(3), 20180781.

(4) Macreadie, P. I., Costa, M. D., Atwood, T. B., Friess, D. A., Kelleway, J. J., Kennedy, H., Lovelock, C. E., Serrano, O., Duarte, C. M. (2021). *Blue carbon as a natural climate solution.* Nature Reviews Earth & Environment, 2(12), 826-839.

(5) Duarte, C. M., Losada, I. J., Hendriks, I. E., Mazarrasa, I., and Marbà, N. (2013). *The role of coastal plant communities for climate change mitigation and adaptation.* Nature climate change, 3(11), 961-968.

(6) Alongi, D.M. (2014). *Carbon cycling and storage in mangrove forests.* Annual Review of Marine Science, 6, 195-219.

(7) Salmo, S. G. III and Gianan, E. L. (2019). *Post-disturbance carbon stocks and rates of sequestration: implications on 'blue carbon' estimates in Philippine mangroves.* Philippine Science Letters, 12(2), 122-132.

(8) Asilo, H. A. M. and Yap-Dejeto, L. G. (2025). *Understanding blue carbon management strategies: quantitative assessment of blue carbon stock among three mangrove stands in Eastern Visayas, Philippines, W. Pacific Border.* Carbon Research, 4(1), 63.

(9) Corcino, R. C. B., Gerona-Daga, M. E. B., Samoza, S. C., Fraga, J. K. R., and Salmo III, S. G. (2023). *Status, limitations, and challenges of blue carbon studies in the Philippines: A bibliographic analysis.* Regional Studies in Marine Science, 62, 102916.

(10) United Nations Framework Convention on Climate Change (UNFCCC). (2015). *Paris Agreement.*

(11) Pendleton, L., Donato, D. C., Murray, B. C., Crooks, S., Jenkins, W. A., Sifleet, S., Craft, C., Fourqurean, J. W., Kauffman, J. B., Marbà, N., Megonigal, P., Pidgeon, E., Herr, D., Gordon, D., and Baldera, A. (2012). *Estimating global "blue carbon" emissions from conversion and degradation of vegetated coastal ecosystems.* PLOS ONE, 7(9): e43542. https://doi.org/10.1371/journal.pone.0043542

(12) Philippine Space Agency (PhilSA) and Department of Environment and Natural Resources (DENR). (2023). *National Mangrove Map of the Philippines.*

(13) Fortes, M. D. (2013). *A review: biodiversity, distribution and conservation of Philippine seagrasses.* Philippine Journal of Science, 142(1), 9.

(14) Sudo, K., Quiros, T. A. L., Prathep, A., Luong, C. V., Lin, H. J., Bujang, J. S., Ooi, J. L. S., Fortes, M. D., Zakaria, M. H., Yaakub, S. M., Tan, Y. M., Huang, X. and Nakaoka, M. (2021). *Distribution, temporal change, and conservation status of tropical seagrass beds in Southeast Asia: 2000–2020.* Frontiers in Marine Science, 8, 637722.

(15) Basconcillo, J. and Bangquiao, N. (2025). Recent increase in the number of Super Typhoons in the Philippines. Tropical Cyclone Research and Review, 14 (4), 340-350, ISSN 2225-6032, https://doi.org/10.1016/j.tcrr.2025.09.001.

(16) Cinco, T. A., de Guzman, R. G., Ortiz, A. M. D., Delfino, R. J. P., Lasco, R. D., Hilario, F. D., Juanillo, E. L., Barba, R., and Ares, E. D. (2016). *Observed trends and impacts of tropical cyclones in the Philippines.* International Journal of Climatology, 36(14), 4638-4650.

(17) Lapidez, J. P., Tablazon, J., Dasallas, L., Gonzalo, L. A., Cabacaba, K. M., Ramos, M. M. A., Suarez, J. K., Santiago, J., Lagmay, A. M. F., and Malano, V. (2015). *Identification of storm surge vulnerable areas in the Philippines through the simulation of Typhoon Haiyan-induced storm surge levels over historical storm tracks.* Nat. Hazards Earth Syst. Sci., 15, 1473–1481, https://doi.org/10.5194/nhess-15-1473-2015.

(18) IUCN. (2016). *National Blue Carbon Policy Assessment Framework: Towards effective management of coastal carbon ecosystems.* Gland, Switzerland: IUCN.

(19) Department of Environment and Natural Resources (DENR), Philippines. *National Greening Program and coastal ecosystem restoration initiatives.*

(20) Climate Change Commission (CCC), Philippines. *National Climate Change Action Plan 2011-2028.*

(21) Department of Agriculture - Bureau of Fisheries and Aquatic Resources (DA-BFAR). *Policies and programs for coastal resource management and blue carbon ecosystems.*

(22) IPCC. (2014). *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands.* Hiraishi, T., Krug, T., Tanabe, K., Srivastava, N., Baasansuren, J., Fukuda, M. and Troxler, T.G. (eds). IPCC, Switzerland.

(23) Zoological Society of London (ZSL) Philippines. Unpublished. *Philippines' Blue Carbon Quantification Protocol (2024 version).* Developed with Philippine blue carbon scientists and practitioners through the USAID-SIBOL Project.

(24) UN System of Environmental-Economic Accounting (SEEA). *Framework for integrating environmental and economic data.* https://seea.un.org/.

(25) Gann, G. D., McDonald, T., Walder, B., Aronson, J., Nelson, C. R., Jonson, J., Hallett, J. G., Eisenberg, C., Guariguata, M. R., Liu, J., Hua, F., Echeverria, C., Gonzales, E., Shaw, N., Decleer, K., and Dixon, K. W. (2019). *International principles and standards for the practice of ecological restoration.* Restoration Ecology. 27 (S1): S1-S46., 27(S1), S1-S46.

(26) IUCN and WRI. (2014). *A guide to the Restoration Opportunities Assessment Methodology (ROAM).* Gland, Switzerland: IUCN.

(27) UNEP. (2020). *Guidelines on Mangrove Ecosystem Restoration for the Western Indian Ocean Region.* Nairobi.

(28) UNEP. (2020). *Guidelines on Seagrass Ecosystem Restoration for the Western Indian Ocean Region.* Nairobi.

(29) *Verified Carbon Standard (VCS) Methodology for Tidal Wetland and Seagrass Restoration.* Verra. https://verra.org/.

(30) IUCN. (2015). *Coastal 'blue' carbon: A revised guide to supporting coastal wetland programs and projects using climate finance and other financial mechanisms.* Gland, Switzerland: IUCN.

(31) United Nations. *Sustainable Development Goals.* https://sdgs.un.org/goals.

PHOTO REFERENCES

PAGE	CAPTIONS AND REFERENCES
Cover	Sheltering boats at the Pedada Integrated Mangrove Eco-Park in Ajuy, Iloilo (Philippines NBCAP, October 2025)
iv-v	Katunggan It Ibajay – KII Mangrove Eco-tourism Park in Ibajay, Aklan (Philippines NBCAP, October 2025)
6	Seagrass meadow in Basco, Batanes (DENR 2/ LI Homigop, 2023)
7	Leganes Integrated Katunggan Ecopark in Leganes, Iloilo (Philippines NBCAP, October 2025)
8	Seagrass biodiversity in the Masinloc – Oyon Bay Protected Landscape and Seascape (DENR 3/ N Eder, 2023)
9	Signage at the Katunggan It Ibajay – KII Mangrove Eco-tourism Park in Ibajay, Aklan (Philippines NBCAP, October 2025)
10-11	Top: Katunggan It Ibajay – KII Mangrove Eco-tourism Park in Ibajay, Aklan (Philippines NBCAP, October 2025); bottom: Seagrass in Taklong Island National Marine Reserve (TINMAR) in Nueva Valencia, Guimaras (ZSL Philippines/ MR Lopez)
14-15	Mangrove walkway at the Katunggan It Ibajay – KII Mangrove Eco-tourism Park in Ibajay, Aklan (Philippines NBCAP, October 2025)
16	Representatives from the World Economic Forum, ZSL Philippines, and DENR-BMB meet with DENR Undersecretary Ernesto Adobo during a courtesy call to discuss ongoing collaboration on blue carbon initiatives in the Philippines (Philippines NBCAP, August 2025)
17	Celebrating the International Day for the Conservation of the Mangrove Ecosystem with the theme “Mangrove Conservation Rooted in Science and Collective Action” (ZSL Philippines, July 2025)
18	Seagrass validation survey in Calatagan, Batangas for the national Seagrass and Coral Map led by the DENR and Philippine Space Agency (DENR-SCIS, February 2025)
19	A researcher obtains a mangrove sediment core sample (WATER Lab, Institute of Biology, University of the Philippines Diliman)
20-21	Seagrass assessment in the Agoo – Damortis Protected Landscape and Seascape (DENR 1/ C Doctolero, 2023)
23	A researcher measures a mangrove trunk (WATER Lab, Institute of Biology, University of the Philippines Diliman)
24-25	Pedada Integrated Mangrove Eco-Park in Ajuy, Iloilo (Philippines NBCAP, October 2025)
26	Cadiz City, Negros Occidental (Philippines NBCAP/ VS Calanda, 2025)
27	Community member at the Pedada Integrated Mangrove Eco-Park in Ajuy, Iloilo (Philippines NBCAP, October 2025)
28	Women at the Pedada Integrated Mangrove Eco-Park in Ajuy, Iloilo (Philippines NBCAP, October 2025)
29	Practical training session at the Pedada Integrated Mangrove Eco-Park in Ajuy, Iloilo during the Mangrove and Beach Forest Rehabilitation and Conservation Training of Trainers (ZSL Philippines, February 2020)
30-31	Working with the local community to survey mangroves (WATER Lab, Institute of Biology, University of the Philippines Diliman)
32	The Philippines NBCAP mentors high school students at UGNAYAN, a community NGO pop-up organized by the EAST PREP Project (Philippines NBCAP, August 2025)
33	Pedada Integrated Mangrove Eco-Park in Ajuy, Iloilo (Philippines NBCAP, October 2025)
34-35	Pedada Integrated Mangrove Eco-Park in Ajuy, Iloilo (Philippines NBCAP, October 2025)
36	Pedada Integrated Mangrove Eco-Park in Ajuy, Iloilo (Philippines NBCAP, October 2025)
36	Participants of the 10th Mangrove and Beach Forest Rehabilitation and Conservation Training of Trainers visit the Leganes Integrated Katunggan Ecopark in Leganes, Iloilo (ZSL Philippines, February 2019)
34	Avila Mangrove Reserve and Migratory Bird Sanctuary in Cadiz City, Negros Occidental (ZSL Philippines)
35	Stakeholders representing multiple sectors at the regional consultation for the development of the Philippines NBCAP Roadmap in Iloilo City (Philippines NBCAP, October 2025)